

## CLAIMS

I claim:

1 Sub 1. A pharmaceutical composition for therapeutic or prophylactic use  
2 comprising a silica containing solid having an average particle size of about 6 microns  
3 or less.

1 2. The pharmaceutical composition according to claim 1 wherein the silica  
2 containing solid is selected from the group consisting of zeolites, silicas, clays, double  
3 hydroxides, and mixtures thereof.

1 3. The pharmaceutical composition according to claim 1 wherein the silica  
2 containing solid is zeolite containing encapsulated metals or metal complexes.

1 4. The pharmaceutical composition according to claim 3 wherein the metal  
2 complexes are metal - salen complexes, phthalocyanines, corrinoides or porphyrines.

1 5. The pharmaceutical composition according to claim 1 wherein the silica  
2 containing solid is silica gel or other silicas containing encapsulated metals, metal  
3 complexes, proteins, DNA or whole cells or tissue samples.

1 6. The pharmaceutical composition according to claim 1 wherein the silica  
2 containing solid is mesoporous aluminosilicate containing encapsulated metal  
3 complexes, proteins, DNA or small molecules having pharmaceutical activity.

1           7.     The pharmaceutical composition according to claim 1 wherein the silica  
2     containing solid is modified by surface adsorption of molecules to enhance the  
3     bioavailability of the silica containing solid.

1           8.     The pharmaceutical composition according to claim 7 where the silica  
2     containing solid is modified by surface adsorption of molecules selected from the  
3     group consisting of vitamin B12 and silanes.

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3 Jul 93 > 9.     The pharmaceutical composition according to claim 1 where the silica-  
containing solid is dealuminated.

10.     The pharmaceutical composition according to claim 1 where the pores of  
the silica containing solid are modified by silanation, methylation, surfactant  
adsorption or other chemical reaction to change the wettability, charge or size of the  
pores.

1           11.    A method to modify gene expression, cell proliferation, death, growth  
2     rate or differentiation by administering to a mammal a silica containing solid as an  
3     antioxidant or oxidant.

1           12.    A method to enhance immunogeneity of protein antigens, other  
2     biological macromolecules, whole cells or cell fragments by administering to a  
3     mammal in need thereof a silica containing solid as a vaccine adjuvant in combination  
4     with protein antigens, whole cells or cell fragments.

1           13.    A method for providing sustained delivery of a pharmaceutically active  
2 agent by using a silica containing solid as a reservoir for the pharmaceutically active  
3 agent.

1           14.    The method of claim ~~13~~ wherein the pharmaceutically active agent is  
2 selected from the group consisting of metals, metal complexes, small molecules,  
3 proteins, DNA, cell fragments and whole cells.

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